DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: NH-002-6(51) Jackson/Hall
P. I. No.: 122150
U.S. 129/S.R. 11 widening/reconstruction

OFFICE: Engineering Services

DATE: December 30, 2004

FROM: David Mulling, P.E., Project Review Engineer RCW

TO: Gerald Ross, P.E., State Road Design Engineer

SUBJECT: IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate alternatives recommended for implementation to the extent reasonable in the design of the project.

ALT NO	Description	Savings PW & LCC	Implement	Comments
1	Eliminate Borrow Excavation by flattening the back slopes and lowering the profile grade to balance earthwork	$1,212,536	Yes	
*2 (Option 1A)	Use 175' long three span bridges at Allen Creek with drilled shaft foundations	$561,916	Yes	Final structure type/length and footing type is dependent on the results of the Hydraulic Study and BFI.
*2 (Option 1B)	Use 120' long three span bridges at Allen Creek with drilled shaft foundations	$720,647	Yes	Final structure type/length and footing type is dependent on the results of the Hydraulic Study and BFI.
2 (Option 2)	Eliminate the left turn lane on the right (NB) bridge at Allen Creek	$248,397	No	Left turn lane would be needed for future anticipated development.
**2 VE Alt. No. 3 (Conspan)	Use multiple precast modular bottomless culvert segments at Allen Creek	-$67,923 (Cost increase)	No	A bottomless culvert is not required by the Environmental Document.

Implementation of Value Engineering Study Alternatives
NH-002-6(51) Jackson/Hall
Page 2

ALT NO	Description	Savings PW & LCC	Implement	Comments
**2 VE Alt. No. 3 (Old Castle)	Use multiple precast modular bottomless culvert segments at Allen Creek	-$1,095,226 (Cost increase)	No	A bottomless culvert is not required by the Environmental Document.
3	Replace the small box culverts with pipes and make the cross drain pipes perpendicular	$63,957	Yes	
***4 (Conspan)	Replace culvert at Sta. 306+39 with precast modular bottomless culvert segment	-$239,652 (Cost increase)	No	A bottomless culvert is not required by the Environmental Document..
***4 (Old Castle)	Replace culvert at Sta. 306+39 with precast modular bottomless culvert segment	-$347,836 (Cost increase)	No	A bottomless culvert is not required by the Environmental Document.
5	Shift the alignment to eliminate the curb and gutter and sidewalk and drain the SB pavement to the median	$118,497	No	Would result in an inconsistent typical section with the cross slope changing from a normal crown to a reverse crown in a tangent section. Would also require additional drainage structure costs in the median that weren't included with the VE Alternate.
6	Use 20' raised median in lieu of the 44' depressed median	$1,579,712	No	This is a rural section which normally requires a 44' depressed median. Additional longitudinal drainage costs for the raised median were not included with the VE Alternate. Would also require additional Consultant design fees.
DC1	TS Nos. 7 though 11 should not have the GAB shown in Metric units	Design Suggestion	Yes	
DC2	Relocate CR 205 further to the south to obtain a better right angle intersection and to shift away from Historic boundary	Design Suggestion	Yes	
DC3	Use Type "B" Median Openings in lieu of Type "A" Median Openings	Design Suggestion	Yes	

ALT NO	Description	Savings PW & LCC	Implement	Comments
DC4	Include right turn/decel lanes at all county roads and major traffic generators	Design Suggestion	Yes	
DC5	Be consistent in labeling slopes on cross sections	Design Suggestion	Yes	
DC6	Use typical cross drain pipe configuration in lieu of a cross drain/slope drain configuration in areas where proposed fill is not excessively high	Design Suggestion	Yes	
DC7	Show Right of Way line on cross sections	Design Suggestion	Yes	

*These VE Alternates are mutually exclusive and are an "either/or" option. This is based on the use of a three span bridge either 120' or 175' long at Allen Creek. The length will be determined by the Hydraulic Study. Minimum savings would be $561,916.

**These VE Alternates are mutually exclusive and are an "either/or" option. This is based on the use of precast bottomless culvert alternatives at Allen Creek.

***These VE Alternates are mutually exclusive and are an "either/or" option. This is based on the use of precast bottomless culvert alternatives at Sta. 306+39.

A meeting was held on December 29, 2004 to discuss the above recommendations. Jim Simpson and Christy Poon of Road Design and Ron Wishon of the Office of Engineering Services were in attendance.

Approved: _____ **Date:** 1/3/05

Paul V. Mullins, P. E., Chief Engineer

DTM/REW

Attachment

c: Gus Shanine
Jim Simpson
Christy Poon
Paul Liles
Doug Franks
James Magnus
Mike Dover
Alexis John
Mike Nash
Lisa Myers

OFFICE OF ROAD DESIGN RESPONSES TO V.E. STUDY:

PROJECT: NH-002-6(51) Jackson and Hall Counties
PI No. : 122150
US 129 / SR 11 (FROM SR 332 TO SR 323)
The Widening and Reconstruction of SR 11 / US 129

CONSTRUCTABILITY

1- Earthwork

Value Engineering Alternative – Eliminate borrow by flattening the back slopes and lower the profile to balance earthwork, if possible.

COMMENTS: This recommendation should be carried forth in areas where it is possible to make changes to the back slopes and profile. The design engineer shall investigate further those locations. (Recommend implementation of this alternative)

2- Allen Creek Bridge

Value Engineering Alternative Number 1 – Three span bridge with drill shaft foundation.

COMMENTS: A three span bridge was recommended to the consultant in our (Office of Bridge Design) original review (March 2000) of this hydraulic study and layout. The foundation type will be recommended in the BFI by the Office of Materials and Research. (Recommend implementation of 3 span design – foundation type pending BFI report)

Value Engineering Alternative Number 2 – Eliminate turn lane on the bridge.

COMMENTS: Due to close proximity to I-85, development is expected to occur along the S.R. 11, and we anticipate the need for left turn lane on the bridge at this intersection of S.R. 11 and S.R. 346. (Recommend No Implementation of this alternative.)

Value Engineering Alternative Number 3 – Multiple pre-cast bottomless culverts.

COMMENTS: In the March 2000 review memo from the Bridge Design Office, one of the comments was for the consultant to consider a standard concrete box culvert since the drainage area is less than 20 sq. miles. A bottomless arch-type structure can also be considered at this site if the foundations can be placed deep enough to withstand possible channel migration and scour.
Acceptable foundations for the arch type bridge culverts are listed below:

a. Spread footings founded in rock or scour resistant material below the streambed elevation;
b. Pile footings; and
c. Concrete bottoms can be used where environment issues are not a concern.

Please note that riprap is not recommended to be placed as a scour countermeasure for new arch type bridge culverts. If it is found that a standard box culvert and/or bottomless arch bridge culvert is hydraulically acceptable, a cost comparison should be performed for the bridge alternate, standard box culvert and bottomless arch structure. (Recommend implementation of this alternative contingent upon the results of hydraulic study and cost comparison)

3- Cross Drain Structures

Value Engineering Alternative – Replace the small box culverts with pipes and make cross drains perpendicular.

COMMENTS: District Maintenance Office reports that all drainage structures are in fair to poor condition and recommend replacement. Structures are recommended to be located to provide the most effective drainage; Perpendicular or skewed placement, whichever is more appropriate. (Recommend implementation of this alternative contingent upon above comment)

4- Box Culvert

Value Engineering Alternative – Replace the existing box culvert entirely with a new pre-cast bottomless culvert.

COMMENTS: The consultant for the project can compare a standard box culvert alternate to a bottomless arch-type bridge culvert as long as the above foundation requirements in the above comments can be met. (Recommend implementation of this alternative after satisfying the requirements above)

5- Curb & Gutter / Sidewalks

Value Engineering Alternative – Shift the alignment to eliminate the curb & gutter and sidewalk and drain the southbound pavement to the median.

COMMENTS: From evaluation of the alignment and the cross sections prepared for the areas where curb and gutter was placed, superelevation will not allow for the southbound pavement to drain to the median. However, as an alternate to eliminate C&G and sidewalk, we recommend the use of V-gutter to properly drain the roadway and minimize impact to property in that area. (Recommend no implementation of this alternative.)

6- Right of Way / Typical Section

Value Engineering Alternative – 20' Raised Median.

COMMENTS: This alternative does not take into consideration installing 6.7 miles of a longitudinal drainage system in the median and increased consultant fees to rework the current design to incorporate a raised median instead of a 44' depressed median. By the completion of the incorporation of this alternative into the plans, the possible savings quoted will drastically be reduced. This area will experience greater benefit with the 44' depressed as far as any future development is concerned. For instance, if traffic increased beyond projections and would require an additional lane; this could be done without the acquiring additional right of way or disturbance to property. (Recommend no implementation of this alternative.)

RECOMMENDATION – DESIGN COMMENTS

1. *Typical Sections 7 – 11 have graded aggregate base shown in metric units.*

2. *Relocate CR 205 further south to obtain better right angle intersection and to shift away from historic boundary.*

3. *Use Type "B" crossovers rather than Type "A" crossovers.*

4. *All county roads and major traffic generators should have right turn lanes.*

5. *Some cross sections have a 2.0:1 shown on the section while others have 2:1. For consistency, the 2:1 should be used on all cross sections.*

6. *Several slope drains are designed at locations where the proposed fill is not excessively high. At these locations, a typical cross drain should be used, even if the median drop inlet becomes deeper. Slope drains present a future maintenance problem if the concrete collar is not correctly constructed or if a separation occurs. Possible locations for this to be considered are STA 475+50, STA 439+35, and STA 427+35. Other proposed slope drains should also be reviewed.*

7. *If the right-of-way line could be shown on roadway cross sections it would aid construction personnel.*

   COMMENTS: The above Recommendation – Design Comments have been reviewed and are considered appropriate changes/corrections to the plans. (Recommend implementation of these design comments)

Wishon, Ron

From: Williams, Rich
Sent: Wednesday, December 29, 2004 3:35 PM
To: Wishon, Ron
Cc: John, Alexis
Subject: P.I. # 122150 - Jackson/Hall Counties

Hey Mr. Ron,

This is in response to your call today concerning the VE study recommendation to use a bottomless culvert instead of a bridge. I have reviewed our comment fields in TPRO and I do not see anything from an environmental standpoint that would require us to use a bottomless culvert instead of a bridge. I have copied Alexis John on this so she can provide any additional information.

Hope this helps,

Rich